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Claims

[c1] 1. A bump structure on a contact pad, comprising:
an under-ball-metallurgy layer over the contact pad;
a bonding mass over the under-ball-metallurgy layer, wherein the bonding mass is formed over the under-ball-metallurgy layer by pressure-bonding; and
a bump over the bonding mass.

[c2] 2. The bump structure of claim 1, wherein the under-ball-metallurgy layer comprises:
an adhesion layer over the contact pad; and
a barrier layer over the adhesion layer, wherein the bonding mass is formed over the barrier layer.

[c3] 3. The bump structure of claim 2, wherein material constituting the adhesion layer is selected from the group consisting of titanium, titanium-tungsten alloy, aluminum and chromium.

[c4] 4. The bump structure of claim 2, wherein material constituting the barrier layer is selected from the group consisting of nickel-vanadium alloy and nickel.

[c5] 5. The bump structure of claim 1, wherein the bonding mass is made from a material including copper.

[c6] 6. The bump structure of claim 1, wherein the bonding mass has a thickness between about 4μm to 10μm.

[c7] 7. The bump structure of claim 1, wherein material constituting the bump includes a lead-tin alloy.

[c8] 8. The bump structure of claim 1, wherein material constituting the bump includes a lead-free alloy.

[c9] 9. The bump structure of claim 7, wherein material constituting the bump is selected from the group consisting of tin, gold, silver, copper, bismuth, antimony, indium, zinc or combinations thereof in the form of an alloy.

[c10] 10. A process of fabricating a bump structure, comprising the steps of:
forming an under-ball-metallurgy layer over a wafer;
pressure bonding a bonding mass onto the upper surface of the under-ball-metallurgy layer;
removing a portion of the under-ball-metallurgy layer so that only a residual under-ball-metallurgy layer remains underneath the bonding mass;
forming a solder material over the bonding mass; and
conducting a reflow process to solidify the solder material into a bump above the bonding mass.

[c11] 11. The process of claim 10, wherein the step of forming

an under-ball-metallurgy layer over the wafer includes the sub-steps of:
forming an adhesion layer over the wafer; and
forming a barrier layer over the adhesion layer.

[c12] 12. The process of claim 11, wherein material constituting the adhesion layer is selected from the group consisting of titanium, titanium-tungsten alloy, aluminum and chromium.

[c13] 13. The process of claim 11, wherein material constituting the barrier layer is selected from the group consisting of nickel-vanadium alloy and nickel.

[c14] 14. The process of claim 10, wherein material constituting the bonding mass includes copper.

[c15] 15. The process of claim 10, wherein the bonding mass has a thickness between about 4 to about 10μm.

[c16] 16. The process of claim 10, wherein material constituting the bump includes a lead-tin alloy.

[c17] 17. The process of claim 10, wherein material constituting the bump includes a lead-free alloy.

[c18] 18. The process of claim 17, wherein material constituting the bump is selected from the group consisting of tin, gold, silver, copper, bismuth, antimony, indium, zinc

or combinations thereof in the form of an alloy.